

function of statistics in the industry, are especially good.

In the space at our disposal, it is impossible to review a work of this nature with justice, and likewise to indulge in that amount of constructive criticism otherwise desired; we would suggest that, in view of its importance as an ultimate source of fuel, considerably more space be devoted to the oil-shale question in future editions, while present refinery practice might with advantage be much more severely criticised, both with regard to technique and design. The author is to be congratulated on the achievement of a remarkably fine work, one that should be widely read by all serious servants of a great industry.

H. B. MILNER.

Our Bookshelf.

Memoirs of the Geological Survey. Special Reports on the Mineral Resources of Great Britain. Vol. 20: Lead and Zinc. The Mining District of North Cardiganshire and West Montgomeryshire. By Dr. O. T. Jones. Pp. vi + 207. (London: H.M. Stationery Office, 1922.) 7s. net.

LIKE the three previous volumes dealing with British lead and zinc ores which have been issued by the Geological Survey, it must be admitted regretfully that the present one has a scientific rather than an economic interest. Some of the mines described in the present volume, like Frongoch mine in Cardiganshire and the Van mine in Montgomeryshire, have been extraordinarily productive; the former has been worked for 59 years and the latter for 51 years, and from each more than 100,000 tons of lead and zinc ores have been produced in the course of its career, but in both cases the really productive period was something like half a century ago. The author suggests that it is just possible that these mines might show an improvement by sinking deeper and reaching harder rocks than the soft shales in which they are now bottomed; the prospect, however, is not a very promising one, and the present low price of lead affords no encouragement to spend money on prospecting operations of a highly speculative nature.

The real value of the present work lies in the excellent study of the formation of the faults and fissures and the mode of their filling which Prof. Jones has supplied in the introductory chapters. The first chapter on the general structure of the area gives a very valuable summary of its leading geological features, while the next two chapters are devoted to a discussion of the leading system of fissures to which the district owes its mineral wealth. Finally, the last chapter deals with a number of important points such as the probable age and sources of origin of the ore filling, and the influence upon it of the country rock traversed by the fissures. These chapters form a most valuable contribution to the study of mineral deposition, and from this point of view, quite apart from any possible remote economic possibilities, Prof. Jones's volume deserves the careful attention of the student of mineral deposits.

H. L.

Some Scottish Breeding Duck: Their Arrival and Dispersal. By Evelyn V. Baxter and Leonora J. Rintoul. Pp. vii + 90. (Edinburgh: Oliver and Boyd, 1922.) 5s. net.

THE problems of the increase and extension of range of ducks in Scotland, and in other countries, have long exercised ornithologists throughout the British Isles. As the authors of the volume under notice point out, protection and a better feeling towards and a greater interest in all wild birds are probably important factors in the case but do not explain everything. Certain species other than ducks are as steadily decreasing, and the rise and fall of a species is a complicated biological problem which may have but indirect association with human interference, or may be due entirely to other causes. The recent colonisation of Scotland by other birds, such as the starling, turtle-dove, and great-crested grebe, may be due to the necessity for an over-abundant species to find new areas and the possibilities of settling in an area where raptorial birds and other enemies have been largely destroyed by man's advance and action.

One factor the authors have not stressed, the growing habit of keeping pinioned ornamental fowl, though they mention bird sanctuaries. Passing birds are often "called down" by pinioned fowl, and some of them may elect to mate and breed. That the direction of spread differs in such ducks as the gadwall and wigeon is no argument against this fact, for the source whence come the visitors has no bearing on the influences which cause them to remain. Many pairs of ducks of various kinds have probably nested in out-of-the-way places for years and been overlooked, for it is only within the last thirty years or so that parts of Scotland have been systematically explored from the ornithological point of view. Sportsmen and keepers are not very particular about the species of the ducks which fill their bags.

We note that the authors use the correct spelling of two much-discussed names, wigeon and shoveler.

An Introduction to Engineering Drawing. By J. Duncan. (Life and Work Series.) Pp. x + 158. (London: Macmillan and Co., Ltd., 1922.) 4s.

THE aim of Mr. Duncan's book is to enable young students of engineering to produce intelligible working drawings of the details of engineering machines and structures. The student is introduced to the proper workmanlike methods of actual engineering practice, and is not allowed the use of any special hybrid methods which are supposed by many to be sufficient for use in schools.

The book commences with a description of drawing instruments, their use and handling; from this, the student is led to the ordinary problems in plain geometry with practical engineering examples such as drawing cams, and plotting small surveys. Afterwards, a little solid geometry introduces the student to oblique and isometric projection, and prepares him for the drawing of engineering details. For this latter portion of the training the author strongly recommends the use of models. A commencement is made with simple fastenings such as bolts and nuts, then the more complicated connexions are dealt with, as exemplified

in tie bar joints, cotter joints, and coupling boxes. The following chapters deal in succession with other engineering details, such as belt and rope pulleys, chain drives including sprocket wheels, bearings of various kinds, and details of shafting, cylinders, and pistons. Finally, structural details involving the usual angles, tees, and channels with the more elaborate columns, girders, and roof truss joints in which the sections are employed give the student a useful introduction to this side of engineering practice.

The book covers much ground in its 158 pages. It is very clearly written, and the publishers' part, in so far as concerns the type and diagrams, is quite perfect. For the purpose of familiarising the budding engineer with the elements of machines and structures the author has produced a most excellent book.

Juvenile Delinquency. By Henry Herbert Goddard. Pp. vi+120. (London: Kegan Paul and Co., Ltd., n.d.) 3s. 6d. net.

No student of modern life can fail to be perturbed by the number of juveniles who come before the courts yearly for offences covering a very wide range. That our present system does not deal with them adequately is obvious.

Delinquent behaviour is fundamentally unsocial behaviour, *i.e.* the child is obeying his own instincts instead of modifying them according to the demands of society. It becomes therefore necessary to ask why a child behaves unsocially. These unsocially behaved children fall into at least two groups, (*a*) those who are mentally too unintelligent to understand social behaviour; and (*b*) those known as psychopaths, who, while having normal intelligence, have not normal control.

The author suggests that these children should be cared for by some bureau organised by the State, which should undertake research work, be able to diagnose cases before the behaviour has become seriously wrong, and also to control the lives of those who will never be able to control them for themselves. He describes in this connexion the Ohio Bureau of Juvenile Research which, although only established in 1914, has yet justified itself by its work.

Outwitting our Nerves: A Primer of Psychotherapy. By Dr. Josephine A. Jackson and Helen M. Salisbury. Pp. viii+403. (London: Kegan Paul and Co., Ltd., n.d.) 7s. 6d. net.

THE stream of books concerned with explanations of modern psychologists in general, and of Freud in particular, for people of little or no psychological knowledge, still flows on. Many fail entirely in their avowed object, being either too condensed to be intelligible, or too popular to be scientific. The effect of a conversion to Freudian doctrines is, only too frequently, of the nature of a wholly uncritical acceptance of much that Freud would call problematical. It is therefore a relief to turn to this book, which not only gives a very fair and balanced account of the findings of psycho-analysis, but also keeps these findings in perspective, showing them in relation to the known laws of biology and psychology. The whole book is characterised by a sense of humour foreign to many writers on the subject, and by sanity of outlook. Written in

an easy and popular style it can be safely recommended to the student of, or sufferer from, "nerves," and even to the reader already cognisant with the literature of psycho-analysis it will prove helpful and interesting.

Imperial Institute: Monographs on Mineral Resources with Special Reference to the British Empire: Silver Ores. By Dr. H. B. Cronshaw. Pp. ix+152. (London: John Murray, 1921.) 6s. net.

THIS addition to the useful Imperial Institute Monographs gives details and statistics of the sources of silver throughout the world. In 1918 the British Empire produced nearly one-fifth of the world's supply, Canada being responsible for the larger part of this amount. The United States headed the list of producers during the war period, but has now been passed again by Mexico. About two-thirds of the world's silver comes from base metal ores, and much of the remainder is obtained from ores worked primarily for gold, so that silver is mainly a by-product of other metallurgical operations. The extraction and uses of silver are dealt with only very briefly in this monograph, and some information as to the metallurgical processes employed in the most important mining regions would have added to its value. This remark applies particularly to the account of the rich and metallurgically interesting Cobalt district of Ontario, which is responsible for the greater part of the Canadian production. These monographs provide much information in a handy form.

A Systematic Qualitative Chemical Analysis: A Theoretical and Practical Study of Analytical Reactions of the more Common Ions of Inorganic Substances. By Prof. G. W. Sears. Pp. vi+119. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1922.) 8s. 6d. net.

THE introductory part of the work under notice contains a brief account of such matters as equilibrium, ionisation, and solubility product. The section on the detection and separation of the metals is in the form of numbered experiments, and is much less clear and useful than the usual arrangement in tables. The explanations of the reactions, however, are very clearly and fully described, and would be useful in supplementing analysis tables. The section on acids relies on precipitation methods with a single sample, and all preliminary tests are omitted. This seems to be a mistake, as many acids are readily found by simple preliminary methods. There appear to be no features which would indicate any marked superiority of the book over existing treatises.

An Introduction to the Chemistry of Radio-Active Substances. By Dr. A. S. Russell. Pp. xi+173. (London: J. Murray, 1922.) 6s. net.

THERE is at present a real need for a small but up-to-date book on radioactivity, in which the subject is dealt with from the chemical as well as the physical side. Dr. Russell's book would seem to supply this need very satisfactorily. It is not overburdened with detail, but gives a balanced account of the subject, which will be found very useful to students. A particularly good feature is the inclusion of the chemical methods of separation and analysis, which sometimes tend to get lost in theoretical speculations.